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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/639,917	08/16/2000	Joseph M. Brand	108298530US	4048

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PERKINS COIE LLP
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EXAMINER

MITCHELL, JAMES M

ART UNIT	PAPER NUMBER
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2813

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/30/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

09/639,917

Applicant(s)

BRAND, JOSEPH M.

Examiner

James M. Mitchell

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3-7,9,33-36,66-75 and 77-82 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3-7,9,33-36,66-75 and 81 is/are allowed.
- 6) ☒ Claim(s) 77-79 and 82 is/are rejected.
- 7) ☒ Claim(s) 80 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>7/26/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This office action is in response to applicant's amendment filed November 9, 2006. The indicated allowability of claims 81 and 82 is withdrawn in view of the newly discovered reference(s) cited below. Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 78, 79 and 82 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang et al. (U.S. 2002/018035) in combination with Joiner et al. (U.S. 5,483,098).

Huang (e.g. Fig. 2F-H) discloses:

(cl. 78) a method for packaging a microelectronic substrate, comprising:
molding an encapsulating material (24) in direct contact with the microelectronic substrate (21); and forming a heat transfer structure (23) in an external surface of the encapsulating material by removing (Fig. 2H) at least a portion of the encapsulating material/from the second surface of the microelectronic substrate to define at least one exposed heat transfer surface of the heat transfer structure ;
(cl. 79) mounting the microelectronic substrate (21) to a support member (20);
electrically coupling (e.g. 22) the microelectronic substrate to the support member;

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disposing the encapsulating material (24) adjacent to both the microelectronic substrate and the support member; and removing at least a portion of the encapsulating material from a region proximate to the microelectronic substrate (Fig. 2G-H).

Huang does not appear to explicitly disclose that its sink has a rib projecting away from the microelectronic substrate.

Joiner (Fig. 3) utilizes a rib projecting away from the microelectronic substrate.

It would have been obvious to one of ordinary skill in the art to incorporate rib with the heat structure of Huang in order to increase heat dissipation as taught by Joiner (Col. 4, Lines 22-24).

Claims 77 is rejected under 35 U.S.C. 103(a) as being unpatentable over Huang et al. (U.S. 2002/018035) and Joiner et al. (U.S. 5,483,098) as applied to claim 82 and further in combination with Dlugokecki et al (U.S. 5,406,117).

Neither Huang nor Joiner appears to explicitly disclose removal by a laser.

However, Dlugokecki (Col. 7, Lines 3-7) utilizes a laser.

It would have been obvious to one of ordinary skill in the art to utilize a laser as known alternate method/means to remove portions of the encapsulating material of Huang as taught by Dlugokecki (Fig. 6, step 104).

Allowable Subject Matter

Claims 3-7, 9, 33-36 and 66-75 are allowed.

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Claim 80 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art discloses in: Hembree, Ho and Dlugokecki forming an opening in an encapsulant over a microelectronic substrate and forming a heat sink in the opening; Bai e heat sink embedded in an encapsulant; Peterson and Hamburger etching to remove portions of encapsulant in direct contact with a microelectronic substrate; Ho also the use of ribbed heat sink; Sono the use of a cylindrical heat sink.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James M. Mitchell whose telephone number is (571) 272-1931. The examiner can normally be reached on M-F 8:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Ex. Mitchell, J.D.
January 13, 2007



CARL WHITEHEAD JR.
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800